Journal of Hospitality and Tourism Management

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ISSN: 2706-6592

Stratford Peer Reviewed Journals and Book Publishing
Journal of Hospitality and Tourism Management
Volume 9||Issue 1||Page 52-74||April||2026|
Email: info@stratfordjournals.org ISSN: 2706-6592

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[1]Sumare Peter Kaitet, [2]Dr. Esther Munyiri & [3]Dr. Bitok Kipkosgei

[1]Graduate Student at the Department of Hospitality and Tourism Management, School of Business, Economics, and Tourism of Kenyatta University. Email: sumarekaitet1@gmail.com. ORCID: https://orcid.org/0000-0001-6375-3008

[2]Lecturer, Department of Hospitality and Tourism Management, School of Business, Economics, and Tourism of Kenyatta University. Email: kagure.esther@ku.ac.ke. ORCID: https://orcid.org/0000-0002-6522-0173

[3]Lecturer, Department of Hospitality and Tourism Management, School of Business, Economics, and Tourism of Kenyatta University. Email: bitok.kipkosgei@ku.ac.ke. ORCID: https://orcid.org/0000-0003-4017-354X

How to cite this article: Kaitet, S. P., Munyiri, E., & Kipkosgei, B. (2026). Environmental Conservation Strategies and Community-Based Tourism Development in the Maasai Mara National Reserve. *Journal of Hospitality and Tourism Management*, 9 (1), 52-74. https://doi.org/10.53819/81018102t5424

Abstract

Community-based tourism (CBT) has gained global recognition as an ethical and practical model for aligning tourism growth with biodiversity conservation. By empowering local communities in tourism initiatives, well-implemented CBT frameworks can strengthen support for wildlife protection and the sustainable use of natural resources. However, challenges such as corruption and the marginalisation of local voices in policymaking often hinder their success. Thus, this study examined the influence of environmental conservation strategies on CBT development in three conservancies-Mara Siana, Mara Naboisho and Olarro-around the Maasai Mara National Reserve, Kenya. Using a mixed-methods design guided by the Sustainable Livelihood Approach and Pimbert and Pretty's typologies of participation, the study found that environmental strategies had a significant influence on CBT development ($\beta = 0.923$, $R^2 = 0.694$). Qualitative insights emphasised persistent gaps in land-use planning and sanitation infrastructure. The study concludes that environmental conservation strategies play a crucial role in advancing community-based tourism development around the Maasai Mara National Reserve, with evidence indicating strong community support for environmental awareness efforts, sustainable material use, and visible ecological gains such as increased wildlife populations and enhanced biodiversity. The study recommends immediate investment in sanitation infrastructure through public-private partnerships or international funding with oversight from the National Environment Management Authority, implementation of integrated land-use planning frameworks that establish buffer zones and community conservancies through participatory processes, and creation of incentive structures that reward tourism operators for adopting sustainable practices in energy efficiency, waste reduction, and water conservation. Additionally, the study recommends empowering communities through formal resource management roles, technical training programs, and transparent revenue-sharing arrangements codified in Community Management Plans with published annual financial reports accessible to all members.

Keywords: *Community-Based Tourism (CBT), Environmental Conservation, Sustainable Development, Wildlife Conservation, Local Participation.*

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1.0 Introduction

Tourism is a manifestation of change, particularly in terms of new livelihood opportunities for people directly or indirectly affected by its impacts, especially the local community (Qian et al., 2017). The tourism sector has exhibited steady growth since the 1960s, evolving into a crucial driver of sociocultural, environmental, and economic development (Velempini & Martin, 2019). Recognising its global significance, the World Travel and Tourism Council (WTTC) acknowledges tourism as a major provider of employment, contributing to approximately one in every 11 jobs worldwide (WTTC, 2021). The sector also accounted for $1.9 trillion in direct Gross Domestic Product (GDP), with $700-800 billion in export revenues in 2021 (United Nations Tourism [UN Tourism], 2022).

Across Africa, the 2021 UN Tourism report noted a sharp 75% decline in international arrivals between 2019 and 2020, primarily due to the global coronavirus (COVID-19) pandemic (UN Tourism, 2021). The pandemic's far-reaching effects were particularly evident in South Africa, where tourism contributed $9.06 billion, or 2.6% of national GDP, in 2019 (South African Tourism, 2020). In East Africa, tourism remains a rapidly growing economic sector, with Kenya and Tanzania recording growth rates of 17% and 16%, respectively (UN Tourism, 2019). According to the Ministry of Tourism and Wildlife (MoTW, 2020), Kenya's tourism industry experienced consistent growth from the 1960s until the political unrest of 2007, which, coupled with adverse travel advisories, significantly reduced revenue. Further decline occurred in 2020, when only 579,600 international arrivals were recorded. The COVID-19 pandemic led to a $125 million loss and the elimination of 60,000 jobs in 2021 (MoTW, 2020).

Despite these impressive revenue figures, there is growing concern over whether tourism earnings truly benefit local communities (Kenya Wildlife Conservancies Association [KWCA], 2020). For instance, a 2015 WTTC report found that only 4.5% of Kenya's tourism revenue reached local populations (WTTC, 2015). Consequently, integrating local communities into tourism decision-making processes requires greater attention (Yunikawati et al., 2021). Phuong et al. (2020) describe community-based tourism (CBT) as a form of tourism that aims to enhance sustainable development by increasing local economic benefits, promoting environmental conservation, and protecting cultural heritage.

A study by Ottichilo et al. (2000) revealed that conservancies in Kenya play a crucial role in both wildlife conservation and livestock production, hosting over 25% of the country's wildlife population. The concept of CBT gained traction in the mid-1960s when international organisations such as the World Bank and the United Nations Environment Programme began supporting small-scale community development projects in the Global South (Ishihara, 2020; Sielinski et al., 2020). In the 1970s, the African Wildlife Foundation (AWF) took a leading role in promoting Community-Based Natural Resource Management (CBNRM), further influencing CBT's evolution (Global Sustainable Tourism Council, 2020). This model is based on the principle that environmental resource management is most effective when local communities are directly involved (Sharpley, 2020).

This shift marked a transition toward a bottom-up approach in CBT project management, moving away from the state-controlled "fortress conservation" model (Mayaka et al., 2019). However, several barriers continue to hinder the adoption of CBT by destination management organisations. These include the negative impacts of tourism on social and cultural heritage, unequal distribution of tourism benefits, and environmental degradation (Yanes et al., 2019). Dangi and Petrick (2021) argue that tourism projects must be locally controlled, economically empowering, culturally respectful, environmentally sustainable, and capable of reducing household poverty. Therefore, this study examined the influence of environmental conservation

strategies on CBT development in three conservancies-Mara Siana, Mara Naboisho, and Olarro-located around the Maasai Mara National Reserve in Narok County, Kenya. Environmental conservation plays a key role in preserving natural resources, protecting wildlife, and safeguarding cultural heritage in the context of tourism development.

2.0 Literature Review

Responsible management of environmental resources is often not prioritised, CBT, unless conservation becomes a pressing concern (Dodds et al., 2018). One notable exception is the Fair Trade in Tourism South Africa (FTTSA). This initiative embeds ecological sustainability within the national tourism framework by promoting community-driven conservation efforts (Dangi & Jamal, 2016). This approach is especially relevant given rising human populations and unsustainable resource consumption, which continue to exert pressure on fragile ecosystems. Therefore, integrating conservation mechanisms at the local level remains crucial for mitigating environmental degradation and fostering long-term sustainability. Chung et al. (2018) examined the relationship between nature-based tourism and biodiversity intensity in protected areas using a regression model, drawing on insights from experts at the International Union for Conservation of Nature (IUCN). Their findings reinforce earlier conclusions by Oldekop et al. (2018), who emphasised the pivotal role of community participation in conservation. However, both studies fall short of clearly outlining the specific functions or contributions of local communities as key stakeholders in sustainable tourism development efforts (Thukia et al., 2022), particularly in operational and decision-making roles.

In contrast, Tubey et al. (2020) directly examined the influence of environmental conservation on the sustainability of CBT. Employing a pragmatic design and descriptive methods, they gathered data from 266 respondents across two conservancies. The study concluded that 65.3% of CBT sustainability could be attributed to effective environmental conservation. Recommendations included strengthening local conservation plans and adopting alternative energy sources to mitigate ecological harm. While the variables in Tubey's study align with those in the current research, differences in geographical scope and contextual dynamics necessitate a comparative, rather than conclusive, interpretation of the findings.

2.1 Theoretical Framework

This study draws on Development Theory and the Sustainable Livelihood Approach (SLA) to examine how environmental conservation strategies influence CBT development. Development theory highlights the interplay between economic, environmental, and social practices in achieving sustainable progress (Coccia, 2019; Visser & Brundtland, 2013). CBT aligns with this model by promoting poverty reduction, cultural preservation, and biodiversity conservation through community participation (Makau, 2017). Building on Arnstein's ladder of citizen participation, Pimbert and Pretty's typology offers a valuable lens for assessing how communities engage with conservation decision-making, ranging from passive consultation to genuine empowerment (Pimbert & Pretty, 1995). This framework also reveals how state-led interventions may manipulate or support local participation at varying levels (Dangi & Petrick, 2021; Graci, 2013). Complementing this, the SLA positions communities as active agents in shaping tourism strategies based on local knowledge and assets (Serrat, 2008). It links livelihood outcomes to environmental factors, institutional structures, and community investments in human and natural capital, particularly under conditions of vulnerability such as tourism seasonality.

3.0 Research Methodology

The research methodology was done in sections.

3.1 Research Design

The study employed a mixed-methods research design, integrating both quantitative and qualitative analyses, as advocated by Dawadi et al. (2021). Schoonenboom and Johnson (2017) highlight that a mixed-methods approach facilitates a deeper understanding and corroboration of study variables, enhancing the robustness of the research outcomes. The adoption of this design was further supported by its successful application in previous studies (Kipkosgei, 2019; Zielinski et al., 2020), which demonstrated its efficacy in similar contexts. Consequently, the mixed-methods design was utilised in this study to provide comprehensive insights and elucidate the relationships between conservation strategies and CBT development within the MMNR in Narok County.

3.2 Study Area

The present study was conducted within three conservancies located in the MMNR: Siana, Naboisho, and Olarro. The selection of these specific locations was informed by their significance and the notable presence of CBT, which UNESCO had recognised as part of the World Heritage Circuit (Narok County Government 2022). Geographically, these conservancies are situated within latitudes 1°25'0"S and longitudes 34°55'0"E (Narok County Government, 2022). Forming part of the Mao ecosystem (Allen et al., 2019), these areas have experienced significant ecological challenges, including a decline in wildlife populations by up to 90% (Ogutu et al., 2016), and an escalation in human-wildlife conflicts, raising concerns about the effectiveness of existing conservation strategies (Kenya Tourism Federation, 2022). These factors emphasise the relevance of the selected conservancies for investigating the interplay between conservation strategies and the development of CBT.

3.3 Target Population

The study targeted a population of 932 respondents, as reported by the MMWCA (2022), primarily comprising conservancy wardens, landowners, committee members, and camp managers, as detailed in Table 1. These respondents were selected to offer valuable insights and facilitate an in-depth analysis of the conservation strategies and their influence on CBT development within the MMNR. Their diverse roles ensured a comprehensive understanding of the dynamics between conservation efforts and tourism outcomes in the study area.

Table 1: Target population

Conservancy	**Targeted Population**				
	Landowners	Camp managers	Committee members	Conservancy wardens	Total
Mara Siana	177	6	9	3	195
Mara Naboisho	554	6	6	3	569
Olarro	153	5	7	3	168
Grand Total					**932**

Source: Maasai Mara Wildlife Conservancies Association (2022)

3.4 Sampling Framework

The study purposively targeted three conservancies: Olarro, Naibosho, and Siana, as they were relevant to the research objective. The target population comprised 932 individuals, categorised into four key stakeholder groups: landowners, committee members, camp managers, and

conservancy wardens. To ensure equity across these groups, stratified random sampling was employed, as recommended by Kothari and Gaurav (2014). Within each stratum, proportionate allocation was used to maintain accurate representation, followed by simple random sampling to give each participant an equal chance of selection. This multi-stage sampling approach minimised selection bias and enhanced the representativeness of the sample. The final sample size of 274 respondents was determined using Krejcie and Morgan's (1970) sampling table, which corresponds to a population of 932. A uniform allocation rate of 29.4% was applied across the strata, as outlined in Table 2. This strategy, aligned with Mugenda and Mugenda's (2003) recommendation for representativeness, enabled robust correlation analysis while addressing the distinct perspectives within the target population.

Table 2: Sample Size Distribution

Conservancy	Landowners		Camp managers		Committee members		Conservancy wardens	
	100%	29%	100%	29%	100%	29%	100%	29%
Mara Siana	177	52	6	2	9	3	3	1
Mara Naboisho	554	161	6	2	6	2	3	1
Olarro	153	45	5	2	7	2	3	1
Sub total		258		6		7		3
Total	**274**							

Source: Author's Creation

3.5 Research Instruments

Data collection employed a mixed-methods approach, utilising structured questionnaires and in-person interviews to gather both quantitative and qualitative insights from diverse stakeholders across the three selected conservancies—Siana, Naboisho, and Olarro. The target respondents included landowners, committee members, camp managers, and conservancy wardens, ensuring balanced representation aligned with the research objectives. Structured questionnaires were administered to landowners and members of the community committee. The tool was divided into two sections: the first gathered demographic data, while the second focused on key study variables on environmental conservation strategies and CBT development. Items were measured using a 5-point Likert scale, enabling consistent and quantifiable responses suitable for statistical analysis (Buchanan, 2017; Saunders *et al*., 2016). This design supported the use of descriptive and inferential techniques, including frequency tables, means, standard deviations, and regression analysis. Complementing the survey, qualitative data were collected through interviews with camp managers and conservancy wardens. These interviews elicited deeper perspectives on the study variables, capturing insights not attainable through structured questionnaires. The integration of qualitative and quantitative tools ensured a comprehensive understanding of the research problem and enriched the analysis of CBT development within the selected conservancies.

3.6 Pretesting

A predetermined sample of 30 respondents was randomly selected for the pretesting phase. Landowners and committee members who participated in the pretesting were excluded from the subsequent data collection process to avoid bias. Conversely, participants from the groups of conservancy wardens and camp managers were included in the main study and also contributed to refining the research instruments by identifying errors and suggesting improvements. The pretesting period took place from March 12 to 13, 2025.

3.6.1 Validity and Reliability

To ensure methodological rigour, the study undertook both validity and reliability tests on its research instruments. Content and internal validity were established through a participatory research approach, whereby the researcher actively engaged with academic supervisors to refine the instruments—a practice endorsed by Sohrabi (2013). In addition, the study's 5-point Likert scale variables were adapted from validated instruments previously used in peer-reviewed research (Ghalia, 2016; Kibiro, 2018), ensuring both conceptual relevance and measurement validity.

Reliability was assessed using internal consistency methods. The study applied Cronbach's alpha to determine the reliability of the quantitative items. As recommended by Cheung et al. (2024), a threshold of 0.6 was used to confirm consistency in social science research. The analysis (see Table 3) indicated that all constructs achieved an alpha value above this threshold, with an average of 0.893 across the 60 sub-variables, thereby confirming the reliability of the scale items. For the interview schedule, reliability was enhanced through iterative refinement. Feedback from two academic supervisors and insights obtained during the pretesting phase were used to revise question phrasing, improve grammatical clarity, and ensure alignment with the study objectives. This process ensured that the qualitative instrument was both linguistically sound and capable of generating reliable, in-depth data.

Table 3: Reliability Findings

Reliability Statistics			
Construct	*No. of sub-variables*	*Cronbach's Alpha*	*Verdict*
Environmental conservation strategies	18	0.824	Reliable
CBT development	13	0.601	Reliable
Overall Reliability	*31*	*0.893*	Reliable

Source: Analysis based on Survey Data 2025

3.7 Data Collection and Analysis

Data collection for this study commenced after receiving formal approval of the thesis proposal and research authorisation from the Graduate School of Kenyatta University, followed by the issuance of a research licence by the National Commission for Science, Technology and Innovation (NACOSTI). The fieldwork was conducted from March 15 to April 18, 2025. To support this process, four research assistants were recruited and trained in the ethical collection of data. Selection criteria included holding at least a bachelor's degree in social sciences, fluency in both English and the Maa language, and familiarity with research methods. Informed consent was obtained from all respondents prior to data collection. Structured questionnaires were administered to landowners and community committee members in the Siana, Naboisho, and Olarro conservancies in Narok County. The questionnaire included both demographic items and constructs aligned with the study's objective: environmental conservation strategies and CBT development. Items were measured using a 5-point Likert scale, allowing for the collection of standardised data suitable for both descriptive and inferential statistical analysis (Buchanan, 2017; Pearlson et al., 2016).

To complement the survey, qualitative interviews were conducted with camp managers and conservancy wardens using a combination of in-person and telephone-based interactions. These interviews provided flexibility for participants with demanding schedules, thereby

improving response rates. Notes were taken during the interviews, and the data were later transcribed, organised thematically, and integrated with the quantitative findings to provide a more comprehensive understanding of the research problem. Quantitative data were cleaned, coded, and analysed using SPSS version 30. Descriptive statistics—such as frequencies, means, standard deviations, and percentages—were used to summarise respondent characteristics and key variables. Inferential statistics, including correlation and both simple and multiple regression analyses, were conducted to examine the strength and significance of relationships among variables. The regression model employed is summarised as follows:

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\varepsilon$$

Where: Y represents CBT development; β0 is the constant term; β1, β2, β3 are the coefficients of the independent variables, and ε denotes the error term.

Qualitative data from key informant interviews were subjected to content analysis, which enabled the extraction of thematic insights that enriched the interpretation of quantitative results. This mixed-methods approach facilitated triangulation, helping to ensure a balanced and comprehensive analysis of the study's objectives.

3.8 Diagnostic Tests

Prior to conducting inferential analyses, diagnostic tests for normality, multicollinearity, and linearity were carried out to ensure that the data met the core assumptions of parametric statistical procedures. These diagnostics were essential in validating the application of correlation, linear regression, and moderation analyses used in the study.

3.8.1 Normality Analysis

Normality was assessed for key study variables, including community-based tourism (CBT) development, enterprise-based conservation strategies, integrated conservation strategies, environmental conservation strategies, and government policies. Since violations of normality can compromise the reliability of inferential statistics such as p-values and confidence intervals (Mishra et al., 2019), both statistical and visual methods were employed. Univariate normality was evaluated using the Anderson-Darling test, which was computed via the R-MVN (Research Multivariate Normality Test) package (version 5.9). Complementary visual inspections were conducted using histograms with overlaid density curves and regression scatterplots for the dependent variable (CBT development). The Anderson-Darling results (see Table 5) indicated approximate normality for several variables. For example, CBT development recorded a test statistic of 0.6484 and a p-value of 0.0898, while environmental conservation strategies showed a statistic of 0.9729 with a p-value of 0.6812. In both cases, the p-values exceeded the 0.05 threshold, leading to a failure to reject the null hypothesis of normality.

Table 5: Anderson-Darling Normality Test

Univariate Tests				
	Variable	*Test*	*Statistic*	*P Value*
1	CBTD	Anderson-Darling	0.6484	0.0898
2	ENVY	Anderson-Darling	0.9729	0.6812
Computed by the R-MVN package, version 5.9				

Note: The Table displays the univariate test results—key: CBT development [CBTD], and environmental conservation strategies [ENVY].

Source: Analysis based on Survey Data 2025

Visual assessments further supported these findings. The histogram for CBT development displayed a symmetrical distribution, with a density curve approximating the bell-shaped curve typical of normal distributions. In addition, scatter plot box results (Figure 1) showed that most variable values clustered within the range of -2 to +2 on both axes, forming a compact square shape—an indication that the dataset for the dependent variable was normally distributed.

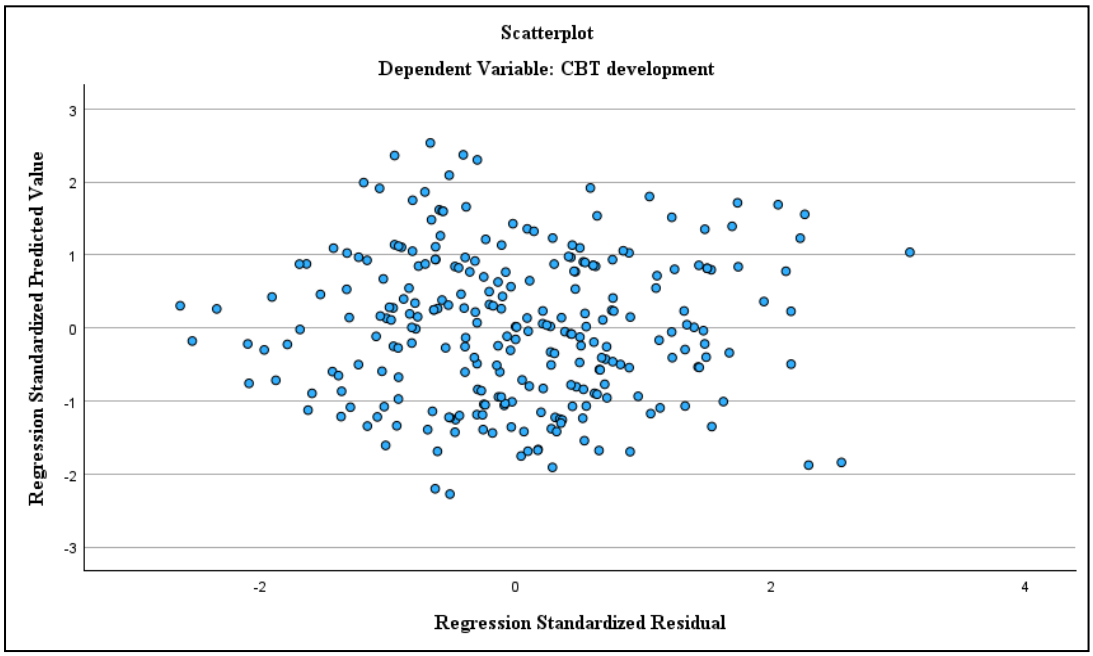

Figure 1: Regression Scatterplot

Source: Analysis based on Survey Data 2025

3.8.2 Multicollinearity Tests

Multicollinearity tests were conducted to assess the extent of correlation among the independent variables, as high intercorrelations can inflate standard errors and compromise the validity of regression estimates (Shrestha, 2020). The analysis employed two standard indicators: tolerance and the variance inflation factor (VIF). Tolerance values below 0.1 and VIF values above 10 typically signal problematic multicollinearity. In this study, the independent variable demonstrated acceptable tolerance values above 0.1 and VIF values below the conventional threshold of concern. The tolerance value recorded was 0.298, while the highest VIF was 3.353. These results confirm the absence of multicollinearity, suggesting that the independent variables were sufficiently distinct and appropriate for use in the regression analysis.

3.8.3 Linearity Test

Linearity was assessed to determine whether the relationship between the dependent variable (CBT development) and the independent variable followed a linear pattern, a key assumption in regression analysis. This assessment was conducted using the "Compare Means" function in SPSS v.30, which enabled comparison between the means of the dependent variable across different values of the independent variables. The analysis revealed a significant linear relationship between environmental conservation strategies and CBT development, with a p-value of 0.273. While this p-value exceeds the conventional threshold of 0.05, suggesting non-significance in strict terms, it was interpreted within the broader regression framework in which visual and statistical checks supported linearity. Consequently, a linear regression model was

deemed appropriate for the analysis, incorporating 31 sub-variables distributed across the four independent variables.

4.0 Findings

The study was conducted in the MMNR, Narok County, across Mara Siana, Mara Naboisho, and Olarro Conservancies. A total of 274 respondents participated: 258 landowners, seven committee members, three conservancy wardens, and six camp managers. Of the 265 questionnaires issued to landowners and committee members, 223 were completed, resulting in a response rate of 84.9%. All nine key informants (wardens and camp managers) also participated, achieving a 100% response rate.

4.1 Demographic Information

(a) Gender: The majority of respondents (77.4%) were male, indicating that men are predominantly involved in conservancy-related activities, consistent with existing literature on the patriarchal structure of the Maasai community (Begi et al., 2022). No respondents identified as intersex.

(b) Age: Most respondents were between 19 and 39 years old (63.2%), with 72.8% qualifying as youth (KNBS, 2019; UNESCO, 2021). This suggests a shift from previously reported low youth engagement in conservation (Cini & Passafaro, 2019; Stanciu et al., 2022).

(c) Education: Respondents had diverse educational backgrounds, with 38.9% having primary-level education, 28.6% holding secondary education, and 21.5% possessing diplomas or certificates. Only 2.6% had no formal education, showing a generally educated population capable of understanding and contributing to conservation efforts (UNESCO, 2022). Thus, it does not matter the form of education, as long as the agendas of stipulated CBT development are actualised and serve towards the attainment of SDGs in a destination (Lemunge et al., 2025).

(d) Occupation: Among landowners and committee members, 50.9% were pastoralists, 37% farmers, 18.5% employed, and 12.5% in business. Only 4.2% were unemployed, primarily due to age or retirement. Pastoralism remains central to livelihoods, although many are transitioning to semi-pastoralism or exploring alternative income sources, such as employment and small business ventures—signs of shifting economic roles under globalisation (Vundi & Koome, 2023).
"*Our traditions of seasonal migrating…are slowly reducing. People now employ others to migrate their animals while they remain in permanent homes…"* [R1]
This reflects the growing influence of devolution and employment in county-level conservation efforts, including initiatives like *Nyumba Kumi*, where locals report illegal logging and poaching (Ndono et al., 2019).

(e) Income: Monthly earnings varied, with 41.9% earning KES 20,000–40,000, 31.7% earning less than KES 20,000, and 24.2% earning KES 40,000–60,000. A small number (2.3%) earned above KES 60,000. Most earn above the national monthly household average of KES 20,123 (Mwaniki, 2022); however, the need for transparent revenue sharing from tourism remains critical.

(f) Years in conservancy membership: Respondents had considerable involvement, with 67.5% having been members for 19–39 years, reflecting long-term commitment to CBT and conservation. Although tenure alone does not determine impact, it demonstrates community stability and sustained participation, which are key for long-term tourism development (Oburah et al., 2021).

4.2 Influence of Demographic Characteristics on CBT Development

To assess the influence of six demographic characteristics on CBT development in MMNR, a Chi-square test was conducted at a 95% confidence level (Table 6). The analysis revealed that age ($\chi^2 = 341.583$, df = 292, p = 0.024), education level ($\chi^2 = 403.474$, df = 292, p = 0.001), conservancy membership ($\chi^2 = 314.696$, df = 292, p = 0.017), and gender ($\chi^2 = 77.448$, df = 146, p = 0.034) significantly influenced CBT development. These findings suggest that factors such as accumulated experience, access to formal or indigenous knowledge, and membership in conservation networks meaningfully shape participation in and benefits from CBT initiatives. One interviewee noted:

"We do not need to go to classes to learn how to manage our grazing lands or interact with the visitors…we have our knowledge on how to even know when seasons (weather) are approaching and what to do. You are born with this knowledge..." [R6]

Table 6: Cross Tabulations of Demographic Characteristics and CBT Development

Variable	Pearson Chi-Square	Df	Assymp. Sig. (2-sided)
Gender	77.448	146	0.034
Age	341.583	292	0.024
Education level	403.474	292	0.001
Occupation	316.955	292	0.151
Monthly earnings	195.561	219	0.871
Conservancy membership	314.696	292	0.017

Note, N=265; p<0.05. Source: Survey Data 2025

This perspective aligns with Phuong et al. (2020b), who argue that both education and age are pivotal for sustaining CBT, especially among youth who engage with conservation through school curricula. Conservancy membership was also seen to offer both symbolic and material benefits, framing members as custodians of shared resources. As one respondent shared:

"I have been a member for over 23 years now, and I can tell you, the conservancy has educated all my children… We are custodians of the land, hence we must get a share of the benefits..." [R7]

These findings align with Kalvelagea et al. (2021), who note that conservancies in Kenya and Namibia commodify communal land, with membership conferring greater access to employment and dividends. However, despite evidence that women's participation improves conservation outcomes (Muigua, 2021), their involvement remains limited due to entrenched patriarchal norms, as reflected in this testimony:

"Although men dominate this area, we as women have come a long way… I am a member of the committee, courtesy of my late husband. This is good as we are three now in that committee and we contribute to the debates of the future of the conservancies." [R9]

James et al. (2023) similarly argue for greater inclusion of women in conservation leadership roles, noting that current gains remain fragile without deeper structural reforms.

In contrast, occupation type ($\chi^2 = 316.955$, df = 292, p = 0.151) and monthly earnings ($\chi^2 = 195.561$, df = 219, p = 0.871) showed no significant relationship with the development of CBT.

This suggests that economic activity or income levels do not inherently determine conservation engagement. One respondent stated:

"The work I do does not in any way affect my contributions towards ensuring that tourism thrives… I still attend the meetings and various deliberations the way it is needed." [R4]

These findings align with Sielinski et al. (2021), who emphasise that CBT frameworks must integrate seamlessly with local livelihoods. Similarly, Gupta et al. (2023) and Wang et al. (2024) demonstrate that in Nepal and Zambia, households with higher tourism income did not necessarily adopt more effective conservation strategies. Instead, governance structures, values, and community cohesion were stronger predictors. A local landowner concluded:

"For me, it is all about the change I can make… earnings from these tourism initiatives do not influence how I conduct my engagements… what we get is just a small percentage, but we complement it with farming or our businesses." [R3]

4.3 CBT Development in MMNR

This study aimed to evaluate the influence of environmental conservation strategies on the development of CBT around the MMNR. A total of 265 respondents were asked to rate their agreement with thirteen statements on CBT development using a 5-point Likert scale. The findings are presented in Table 7.

4.3.1 Perceptions of CBT Development

Overall, respondents expressed a positive outlook on CBT's socio-economic and infrastructural contributions. A notable 83.1% (30.6% strongly agreed; 52.5% agreed) affirmed that improved infrastructure, such as roads and lighting, enhanced community security. Similarly, 85.7% (35.5% strongly agreed; 50.2% agreed) believed tourism had improved their quality of life, while only 3.0% disagreed. Conversely, opinions diverged on whether ecotourism ensures economic independence for locals. Only 34.3% agreed, while 27.5% disagreed and 8.7% remained neutral, reflecting the complexity of translating tourism gains into economic autonomy. Environmental and cultural respect, however, garnered strong consensus, with 79.6% (27.9% strongly agreed; 51.7% agreed) endorsing the effectiveness of tourist education programs. Additionally, 78.9% believed lodges used local materials and labour, and 86.0% reported consistent increases in tourist arrivals. Notably, 95.8% supported the view that rising visitation signals long-term viability for CBT. Respondents also expressed confidence in local governance, with 92.4% acknowledging that conservancies are co-managed by trained community members.

4.3.2 Themes and Emerging Issues

Skill-building initiatives were deemed effective in reducing employment gaps by 89.0% of respondents. Meanwhile, 88.0% felt revenue distribution was fair, although transparency received slightly lower approval (80.7%). Partnership initiatives between communities and NGOs were positively viewed by 77.7%, and 92.8% supported government–private collaborations to expand market linkages. These findings emphasise a generally optimistic perception of CBT development and its alignment with sustainable tourism principles (United Nations, 2022).

Table 7: CBT Development Descriptive Statistics

Statement	SA	A	N	D	SD	$\bar{\chi}$	σ

Improved infrastructure, including roads and lighting, has enhanced community security.	81 (30.6%)	139 (52.5%)	37 (14%)	4 (1.5%)	4 (1.5%)	1.91	0.797
Tourism development has elevated the overall quality of life.	94 (35.5%)	133 (50.2%)	30 (11.3%)	5 (1.9%)	3 (1.1%)	1.83	.787
Ecotourism provides sustainable economic independence for locals.	86 (32.5%)	83 (1.9%)	23 (8.7%)	73 (27.5%)	0	2.31	1.192
Tourist education programs promote respect for environment and culture.	74 (27.9%)	137 (51.7%)	49 (18.5%)	4 (1.5%)	1 (0.4%)	2.30	0.730
Lodges use locally sourced materials and labour.	85 (32.1%)	121 (46.8%)	53 (17.9%)	5 (1.9%)	1 (0.4%)	2.26	1.817
Tourist arrivals at conservancy lodges have increased consistently.	137 (51.7%)	91 (34.3%)	36 (13.6%)	1 (0.4%)	0	1.68	0.795
Rising visitation indicates long-term CBT viability.	158 (59.6%)	96 (36.2%)	7 (2.6%)	4 (1.5%)	0	1.46	0.627
The conservancies are co-managed by trained community members.	141 (53.2%)	104 (39.2%)	20 (7.5%)	0	0	1.54	0.633
Skill-building programs have helped reduce employment gaps in the tourism sector.	123 (46.4%)	113 (42.6%)	23 (8.7%)	0	6 (2.3%)	1.67	0.730
Revenue distribution fairly reflects the contributions of land and resources.	134 (50.6%)	99 (37.4%)	18 (6.8%)	12 (4.5%)	2 (0.8%)	1.68	0.849
Transparent revenue-sharing strengthens community trust.	114 (43.0%)	100 (37.7%)	16 (6.0%)	34 (12.8%)	1 (0.4%)	1.90	1.016
Community actively sustain NGO's partnerships.	95 (35.8%)	111 (41.9%)	27 (10.2%)	26 (9.8%)	6 (2.3%)	2.01	1.030
Government-private collaborations expand CBT market linkages	142 (53.6%)	104 (39.2%)	12 (4.5%)	0	7 (2.6%)	1.56	0.705
Average						**2.24**	**0.56**

Key: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree, $\bar{\chi}$= Mean, and σ=Standard Deviation. Source: Survey Data 2025

For example, improvements in quality of life ($\bar{\chi}$ = 1.83, σ = 0.787), co-management ($\bar{\chi}$ = 1.54, σ = 0.633), and increased visitation ($\bar{\chi}$ = 1.46, σ = 0.627) reflect key areas of progress. However, economic independence ($\bar{\chi}$ = 2.31, σ = 1.192), transparency ($\bar{\chi}$ = 1.90, σ = 1.016), and partnerships ($\bar{\chi}$ = 2.01, σ = 1.030) received relatively lower satisfaction scores, pointing to latent structural challenges. Camp managers offered complementary insights:

"Although the locals cannot economically depend entirely on CBT gains, we have seen the little they get and how it complements their livelihoods from livestock rearing and small-scale farming... You can tell their quality of life has improved gradually" [R4].

"The fact that we have integrated the locals in decision-making... shows investors' willingness to appreciate their inputs in co-management models and respect the environment... marinated with the local culture" [R9].

These accounts validate the importance of participatory governance and sociocultural inclusion in CBT.

4.3.3 Challenges: Revenue Sharing, Transparency, and Partnerships

Despite strong community support, the findings reveal weaker linkages in revenue distribution ($\bar{\chi}$ = 1.68), transparency ($\bar{\chi}$ = 1.90), and partnership arrangements ($\bar{\chi}$ = 2.01). These concerns align with findings from Afenyo-Agbe and Mensah (2022), who noted that elite capture and lack of governance transparency often undermine equitable benefit-sharing in CBT settings. Similarly, Jackson (2025) found that foreign dominance and opacity in partnerships across Nepal, Costa Rica, Kenya, Zimbabwe, and South Korea resulted in high economic leakages and limited community gains, threatening the attainment of SDGs 1 and 8. Ates and Bayram (2024) further observed in Turkey that CBT initiatives often fail without inclusive governance, leaving communities feeling marginalised. In MMNR, this sentiment was reiterated by several informants:

"Revenue sharing often looks good on paper, but in practice, locals feel sidelined because the process lacks openness. True sustainability requires that communities see and feel the benefits directly..." [R7].

"Partnerships with private actors or NGOs can bring resources, but they often come with conditions that limit local control... For these collaborations to work, they must prioritise empowering communities..." [R2].

"When locals do not understand how revenues are distributed or decisions are made, they lose faith in the system. Transparency is about involving communities so they can hold stakeholders accountable" [R6]

These narratives affirm the critical need for inclusive governance, transparent benefit-sharing, and equitable partnerships—tenets that lie at the heart of sustainable CBT.

4.4 Influence of Environmental Conservation Strategies on CBT Development

This study examined the impact of environmental conservation strategies on CBT development in the vicinity of the Maasai Mara National Reserve (MMNR) in Narok County. Using descriptive and inferential statistics, including content analysis, regression modelling, and hypothesis testing, the analysis summarises respondent perceptions of 18 environmental conservation statements (Table 8). Notably, 77.4% of respondents reported significant increases in wildlife populations ($\bar{\chi}$= = 1.89, σ = 1.04), and 66.4% observed improved diversity of plant and animal species ($\bar{\chi}$ = 2.08, σ = 0.96), underscoring successful conservation outcomes. However, concerns about ecological balance persist, as 11.3% expressed dissent. Similarly, 75.4% believed natural resource allocation minimises community conflicts ($\bar{\chi}$=1.97, σ=0.96), and 72.1% noted reduced competition between wildlife and livestock for grazing and water ($\bar{\chi}$=2.05, σ=1.02). Despite these advancements, 8.7% highlighted seasonal resource scarcity, indicating ongoing challenges. Human-wildlife conflict mitigation was effective for 73.2% ($\bar{\chi}$=2.05, σ=1.05), though 9.8% reported persistent issues, necessitating sustained vigilance. Energy initiatives demonstrated robust community engagement, with 83.1% acknowledging biogas as a viable alternative ($\bar{\chi}$= = 1.72, σ = 0.89), 78.1% recognising increased solar energy adoption ($\bar{\chi}$ = 1.87, σ = 1.02), and 84.5% endorsing conservation-led energy education ($\bar{\chi}$ = 1.68, σ = 0.85).

Table 8: Descriptive Statistics for Environmental Conservation Strategies

Statement	SA	A	N	D	SD	Mean ($\bar{\chi}$)	SD (σ)
Wildlife populations increased significantly	45.7%	31.7%	11.3%	10.2%	1.1%	1.89	1.04
Resource allocation minimises conflicts	36.2%	39.2%	17.0%	6.0%	1.5%	1.97	0.96
There is reduced wildlife-livestock competition	35.1%	37.0%	19.2%	5.7%	3.0%	2.05	1.02
There are fewer human-wildlife conflicts	35.1%	38.1%	17.0%	6.0%	3.8%	2.05	1.05
Biogas awareness as an energy alternative	50.6%	32.5%	10.9%	6.0%	0%	1.72	0.89
There is increased solar energy adoption	46.0%	32.1%	13.2%	6.4%	2.3%	1.87	1.02
Conservancy promotes energy education	51.7%	32.8%	11.7%	3.0%	0.8%	1.68	0.85
There are fair land lease returns	20.8%	52.1%	19.6%	7.5%	0%	2.14	0.83
There is adequate pasture planning	16.6%	23.8%	32.1%	20.8%	6.8%	2.77	1.16
There is higher land productivity	19.6%	20.0%	33.2%	18.5%	8.7%	2.77	1.21
There are accessible toilet facilities	15.8%	30.6%	23.4%	21.9%	8.3%	2.76	1.20
There are proper waste disposal practices	15.8%	28.7%	29.8%	20.0%	5.7%	2.71	1.13
There is regular sanitation education	23.4%	19.2%	34.0%	14.3%	9.1%	2.66	2.24
There is improved species diversity	33.2%	33.2%	27.2%	5.3%	1.1%	2.08	0.96
There are anti-degradation measures that are effective	26.8%	34.7%	20.8%	12.5%	5.3%	2.35	1.16
There are adequate water access projects	32.8%	42.6%	17.0%	5.3%	2.3%	2.02	0.96
There is practical, sustainable material use	57.7%	32.5%	7.5%	2.3%	0%	1.54	0.73
There are impactful conservation campaigns	58.5%	32.1%	4.5%	1.9%	0%	1.51	0.69
Average						**2.14**	**0.51**

Key: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree, $\bar{\chi}$= Mean, and σ=Standard Deviation. Source: Survey Data 2025 (SPSS Analysis).

However, financial and infrastructural barriers hinder broader adoption. Land governance revealed significant weaknesses, with only 40.4% agreeing that land-use planning ensures adequate pasture for livestock and wildlife ($\bar{\chi}$= = 2.77, σ = 1.16), and 39.6% affirming that higher land productivity is achieved compared to alternative uses ($\bar{\chi}$ = 2.77, σ = 1.21). These findings suggest inefficiencies requiring participatory reforms. Sanitation infrastructure also

lagged, with 46.4% reporting accessible toilet facilities ($\bar{\chi}$ = 2.76, σ = 1.20) and 44.5% noting proper waste disposal practices ($\bar{\chi}$ = 2.71, σ = 1.13), highlighting systemic deficiencies. Conversely, sustainable practices excelled, with 90.2% endorsing effective material use and recycling ($\bar{\chi}$ = 1.54, σ = 0.73) and 90.6% praising impactful conservation awareness campaigns ($\bar{\chi}$ = 1.51, σ = 0.69), thereby establishing a regional benchmark for sustainability.

Qualitative insights from key informants reinforced these findings. A camp manager emphasised, "Conservation campaigns teach us to protect the environment while benefiting from tourism" [R5], highlighting the role of education in fostering sustainable practices. Conversely, a conservancy warden noted, "Wildlife prioritisation limits grazing land, causing tension" [R3], underscoring land-use conflicts. Another informant highlighted sanitation challenges, stating, "Sanitation and waste disposal issues hinder tourism in remote areas" [R6], emphasising the need for infrastructure improvements. Statistical analyses further validated the relationship between conservation strategies and CBT development. A Pearson correlation analysis (see Table 9) revealed a strong positive correlation ($r = .833$, $p < .001$), indicating that robust conservation practices, such as wildlife protection and sustainable resource management, significantly drive CBT growth.

Table 9: The overall correlation between Environmental Conservation Strategies and CBT development

		CBT development	**Environmental Conservation Strategies**
CBT development	Pearson	1.000	
	Sig. (2-tailed)		
	N	265	
Environmental Conservation Strategies	Pearson	.833**	1.000
	Sig. (2-tailed)	<.001	
	N	265	265

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Survey Data 2025 (SPSS Analysis)

Linear regression analysis (see Table 10) confirmed this, with environmental conservation strategies explaining 69.4% of the variance in CBT development ($R^2 = .694$, $F = 596.120$, $p < .001$) (see Table 11). Furthermore, the regression model, CBT development = 0.266 + 0.923 (Environmental conservation strategies) + εi, demonstrated a significant positive effect ($\beta = 0.923$, $p < .001$) (see Table 12). This coefficient suggests that a one-unit increase in environmental conservation strategies is associated with a 0.923-unit increase in CBT development, holding other factors constant.

Stratford Peer Reviewed Journals and Book Publishing
Journal of Hospitality and Tourism Management
Volume 9||Issue 1||Page 52-74||April||2026|
Email: info@stratfordjournals.org ISSN: 2706-6592

Table 10: Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	.833[a]	.694	.693	.31212	.694	596.120	1	263	<.001

a. Predictors: (Constant) Environmental Conservation Strategies

b. Dependent Variable: CBT development

Source: Analysis from Survey Data 2025 (SPSS Analysis)

Table 11: ANOVA Results

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.073	1	58.073	596.120	<.001[b]
	Residual	25.621	263	.097		
	Total	83.694	264			

a. Predictors: (Constant) Environmental Conservation Strategies
b. Dependent Variable: CBT development

Source: Analysis from Survey Data 2025 (SPSS Analysis)

Table 12: Regression Coefficients

Coefficients[a]

Model		Unstandardised Coefficients B	Unstandardised Coefficients Std. Error	Standardised Coefficients Beta	t	Sig.
1	(Constant)	.266	.083		3.201	.002
	Diversification strategies	.923	.038	.833	24.416	<.001

a. Dependent Variable: CBT development

Source: Analysis from Survey Data 2025 (SPSS Analysis)

The hypothesis test, comparing a t-value of 24.416 to a critical value of 1.96 ($p < .001$), rejected the null hypothesis, affirming that environmental conservation strategies have a positive influence on CBT development in MMNR conservancies.

The resultant regression model is expressed as:

CBT development=0.266+0.923 (Environmental conservation strategies) +εi,

where, εi = error term

4.5 Discussion of Findings

The descriptive analysis reveals that environmental conservation strategies have a generally positive impact on CBT development in the MMNR area of Narok County, although some areas require improvement. Many respondents, 90.6%, agreed that conservation awareness campaigns are frequent and impactful ($\bar{\chi}$=1.51, σ = 0.69), and 90.2% supported the effective use of sustainable materials and recycling ($\bar{\chi}$ = 1.54, σ = 0.73). These high agreement rates show that the community strongly supports efforts to promote CBT sustainability. Additionally,

77.4% noted significant growth in wildlife populations ($\bar{\chi}$ = 1.89, σ = 1.04), and 66.4% observed improved diversity in plant and animal species ($\bar{\chi}$ = 2.08, σ = 0.96), indicating that conservation efforts are helping to support biodiversity. However, only 40.4% felt that land-use planning ensures enough pasture for livestock and wildlife ($\bar{\chi}$ = 2.27, σ = 1.13). Sanitation infrastructure was a concern, with just 46.4% agreeing that toilet facilities are accessible ($\bar{\chi}$ = 1.20, σ = 1.20), and 44.5% confirming proper waste disposal practices ($\bar{\chi}$ = 2.71, σ = 1.13). These results suggest that while environmental strategies are effective in some areas, land governance and sanitation require further attention. Qualitative insights from key informants support these findings and add a deeper understanding. A camp manager highlighted the success of awareness campaigns, stating,

"*The conservancy's campaigns on recycling and conservation have taught us how to protect our environment while benefiting from tourism*" [R5].

However, challenges were also raised. A conservancy warden pointed out land-use issues and sanitation gaps, explaining,

"The conservancy often prioritises wildlife over our livestock, leaving us with limited grazing land, which causes tension" [R3].

"*Many of us do not have proper toilets, and waste disposal is not regular… which makes it hard to maintain a good environment for tourists*" [R6].

These views suggest that while environmental strategies are effective in some respects, they must also address land conflicts and infrastructure to support CBT fully. The correlation analysis further confirms the strong link between environmental conservation strategies and CBT development. A Pearson correlation coefficient of 0.833 ($p < 0.001$) indicates a robust positive relationship, meaning that better conservation practices lead to improved CBT outcomes. This aligns with the descriptive findings, particularly the high agreement on sustainability and biodiversity, which are crucial for attracting tourists. However, weaker areas, such as land-use planning and sanitation, may limit this relationship, suggesting that addressing these issues could enhance the effectiveness of conservation efforts for CBT growth. The inferential statistics provide more evidence of this impact. The regression analysis yielded an R^2 value of 0.694, indicating that environmental conservation strategies account for 69.4% of the variance in CBT development ($F = 596.120$, $p < 0.001$). This significant impact emphasises the importance of conservation for tourism success. However, the remaining 30.6% of unexplained variance suggests that other factors, such as funding or access to the tourist market, may also play a role in the development of CBT.

These findings are similar to recent studies on environmental conservation and CBT. For example, Mahingi (2021) found that in Kenya's Aberdare region, conservation strategies increased wildlife populations by 70%, supporting tourism growth, which aligns with the 77.4% agreement on wildlife growth in this study. However, they also noted land-use conflicts as a challenge, which aligns with the concerns raised by the study's findings. Similarly, a 2022 study in Uganda by Kyoshabire (2024) reported that sustainable practices, such as recycling, improved CBT by 85%, aligning with the 90.2% agreement on sustainable material use in this study. In contrast, a 2024 study in Brazil by Almeida et al. (2022) found higher sanitation access (70%) in conservation areas, unlike the 46.4% here, possibly due to better infrastructure funding in Brazil.

A 2021 study in Namibia by Schneider (2024) found that water access projects in conservancies supported both wildlife and communities, with 80% agreement, a finding similar to the 75.4% reported in this study. However, they emphasised the need for maintenance in dry areas.

Meanwhile, a 2023 study in Thailand by Singhasenee and Iamsomboon (2022) found that alternative energy, such as biogas adoption, was widely accepted (88%), which is close to the 83.1% reported here. However, they highlighted financial barriers to adoption, which may explain the dissent in this study. Additionally, a 2025 study in Peru by Huambachano & Cooper (2021) noted that poor land-use planning in conservancies led to 35% community dissatisfaction, echoing the 27.6% dissent in this study. These comparisons demonstrate that environmental conservation strategies often support CBT; however, their success depends on addressing local challenges, such as land governance and infrastructure. Thus, as indicated in the study's findings, issues such as land-use planning and sanitation gaps require urgent attention to ensure that all community members benefit.

5.0 Conclusion

The study concludes that environmental conservation strategies play a crucial role in advancing community-based tourism development around the Maasai Mara National Reserve, with evidence indicating strong community support for environmental awareness efforts, sustainable material use, and visible ecological gains such as increased wildlife populations and enhanced biodiversity. However, persistent challenges in land-use planning and basic sanitation infrastructure undermine the broader benefits to communities, as inadequate toilet facilities and erratic waste management systems signal infrastructural weaknesses that restrict the full potential of conservation-led tourism. While conservation strategies lay a strong foundation for CBT development, their success depends fundamentally on closing critical gaps in land governance, infrastructure provision, and transparent benefit-sharing mechanisms that balance conservation objectives with pastoral livelihood requirements.

6.0 Recommendations

The study recommends immediate investment in sanitation infrastructure through public-private partnerships or international funding with oversight from the National Environment Management Authority, implementation of integrated land-use planning frameworks that establish buffer zones and community conservancies through participatory processes, and creation of incentive structures that reward tourism operators for adopting sustainable practices in energy efficiency, waste reduction, and water conservation. Additionally, the study recommends empowering communities through formal resource management roles, technical training programs, and transparent revenue-sharing arrangements codified in Community Management Plans with published annual financial reports accessible to all members. Future research should conduct comparative studies across Kenya's protected areas to assess the broader effectiveness of conservation strategies, with particular focus on community participation, land-use coherence, sanitation solutions appropriate for pastoral settings, and governance structures that genuinely accommodate pastoral mobility patterns while protecting wildlife corridors.

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